



Inside a Charcot Joint

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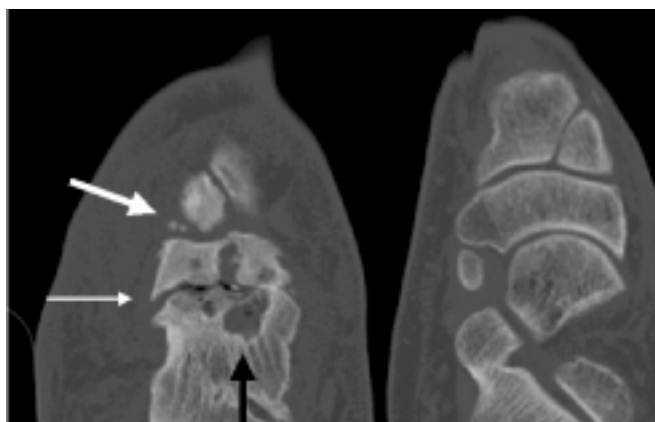


Figure 1. An axial CT scan through the ankle at the level of the talonavicular joint. Note the narrowing of the right talonavicular joint space and osteophyte formation (thin white arrow), pseudocyst formation (black arrow) and bone fragments (thick white arrow). A pathologic fracture of the navicular bone is seen. Compare with normal left ankle.

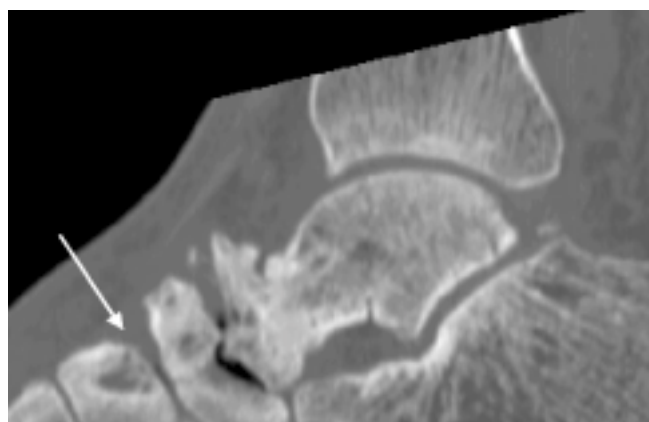


Figure 2. A sagittal reformat of the same CT scan through the right ankle demonstrates involvement of the medial cuneiform bone (arrow) in addition to the severe changes in the talonavicular joint.

A 42 year old man with type 1 diabetes mellitus for at least 20 years developed moderate pain in his right foot and difficulty in walking. Three years previously he had experienced similar discomfort in his right foot that had resolved spontaneously. On examination he was found to be extremely obese (body mass index 33) and mildly hypertensive. The right foot had moderate swelling as well as extreme erythema, but only mild tenderness on light pressure.

Despite a daily regimen of 64 units of insulin the diabetes was uncontrolled (HgbA1c 11.3%). Administration of non-steroidal anti-inflammatory drugs, antibiotics and a short course of heparin provided no relief. A Doppler study of the lower limb arteries and venous drainage disclosed no abnormal findings. We assumed that the long-standing diabetes was ascribed to the

“gloves and socks” hypoesthesia, therefore an electrodiagnostic study was not ordered. Arthrocentesis was postponed until the imaging procedures could clearly determine whether there was excessive synovial within the involved joint.

The computed tomography images of the ankle [Figure 1] through the talonavicular joints shows the typical changes of “hypertrophic” neuropathic osteoarthropathy in the right ankle. These include joint space narrowing, osteophyte formation, bone debris, sclerosis, deformity and joint subluxation. A pathologic fracture of the navicular bone with bone resorption and sharp edges is seen.

The classical radiographic findings are long-standing plantar tarso-metatarsal fractures (Lisfranc fractures) with eburnation and fragmentation. Unusually calcaneal fractures and talocalcaneal joint

dissolution with talar collapse into the calcaneus, distal tibular fractures and talar angulation are also seen. Two radiographic patterns are recognized. The hypertrophic pattern with eburnation, osteophyte formation and fragmentation is more common. The atrophic pattern demonstrates osteopenia and widespread bone resorption. The two patterns probably represent a continuum.

About 5% of all diabetics develop neuropathic articular changes, also termed the Charcot joint. Continuous ambulation on a neuropathic joint results in degeneration and destruction of the joint. Most commonly the foot and ankle are observed to be swollen and unstable. As expected, the degree of tenderness is less than one would anticipate considering the appearance of the joint. As time passes the longitudinal arch of the foot collapses

and crepitus can be detected. The synovial fluid composition of the involved joints is mainly non-inflammatory or hemorrhagic but may also contain mononuclear cells [1,2].

Distinguishing this clinical condition from osteomyelitis may be a difficult task due to their relatively high frequency in this population of diabetic patients and to the abundance of osseous debris in both conditions. One must remember that often both medical conditions may coexist. Unusual pathogens such as a mycobacterial or fungal infection should not be forgotten.

The evaluation of a diabetic patient who presents with an apparent soft tissue swelling should include the comparison of bilateral weight-bearing radiographs. Indium-111 leukocyte scanning is highly specific for infection and may assist in its localization. Magnetic resonance imaging is extremely sensitive, but it may also lead to false positive results. Standard laboratory tests such as erythrocyte sedimentation rate and white blood cell counts are often insufficient and do not distinguish between these two

conditions. Therefore, synovial and bone biopsies may be required to establish a definitive diagnosis [3].

References

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